
Varnost strojev – Integrirani proizvodni sistemi – Osnovne zahteve (ISO/DIS 11161:2005)

Safety of machinery - Integrated manufacturing systems - Basic requirements (ISO/DIS 11161:2005)

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Safety of machinery - Integrated manufacturing systems - Basic requirements (ISO/DIS 11161:2005)

Sécurité des machines - Systèmes de fabrication intégrés -
Prescriptions fondamentales (ISO/DIS 11161:2005)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 114.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN ISO 11161:2005) has been prepared by Technical Committee ISO/TC 199 "Safety of machinery" in collaboration with Technical Committee CEN/TC 114 "Safety of machinery", the secretariat of which is held by DIN.

This document is currently submitted to the parallel Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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The text of ISO 11161:2005 has been approved by CEN as prEN ISO 11161:2005 without any modifications.

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ANNEX ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 98/37 EEC

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Once this standard is cited in the Official Journal of the European Communities under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

WARNING: Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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Safety of machinery — Integrated manufacturing systems — Basic requirements

Sécurité des machines — Systèmes de fabrication intégrés — Prescriptions fondamentales

[Revision of first edition (ISO 11161:1994)]

ICS 13.110; 25.040.01

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The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11161 was prepared by Technical Committee ISO/TC 199, *Safety of machinery*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 11161:1992), which has been technically revised.

Annexes A to D are informative.

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Introduction

An integrated manufacturing system (IMS- see 3.1) can be very different in terms of size and complexity, and can incorporate different technologies that require diverse expertise and knowledge.

An integrated manufacturing system should be considered to be a whole new and different machine rather than simply its parts combined. The integrator (see 3.15) needs the cooperation of entities who individually may know only a part of the whole. A portion of the complexity is that it is generally impractical to stop the whole integrated manufacturing system, yet there will be requirements for manual intervention e.g. inspection, maintenance, and setup, on an on-going basis. Requirements of this standard provide for the safety of the individuals who perform these tasks. Safeguarding for these tasks relates to the concept and use of “zones”.

The aim of this standard is to describe how to apply the requirements of ISO 12100-1: 2003, ISO 12100-2:2003 and ISO 14121 in this specific context. This standard is a type-B standard.

A general configuration of an integrated manufacturing system is shown in Figure 1.

Some examples of integrated manufacturing systems are included in Annex A.

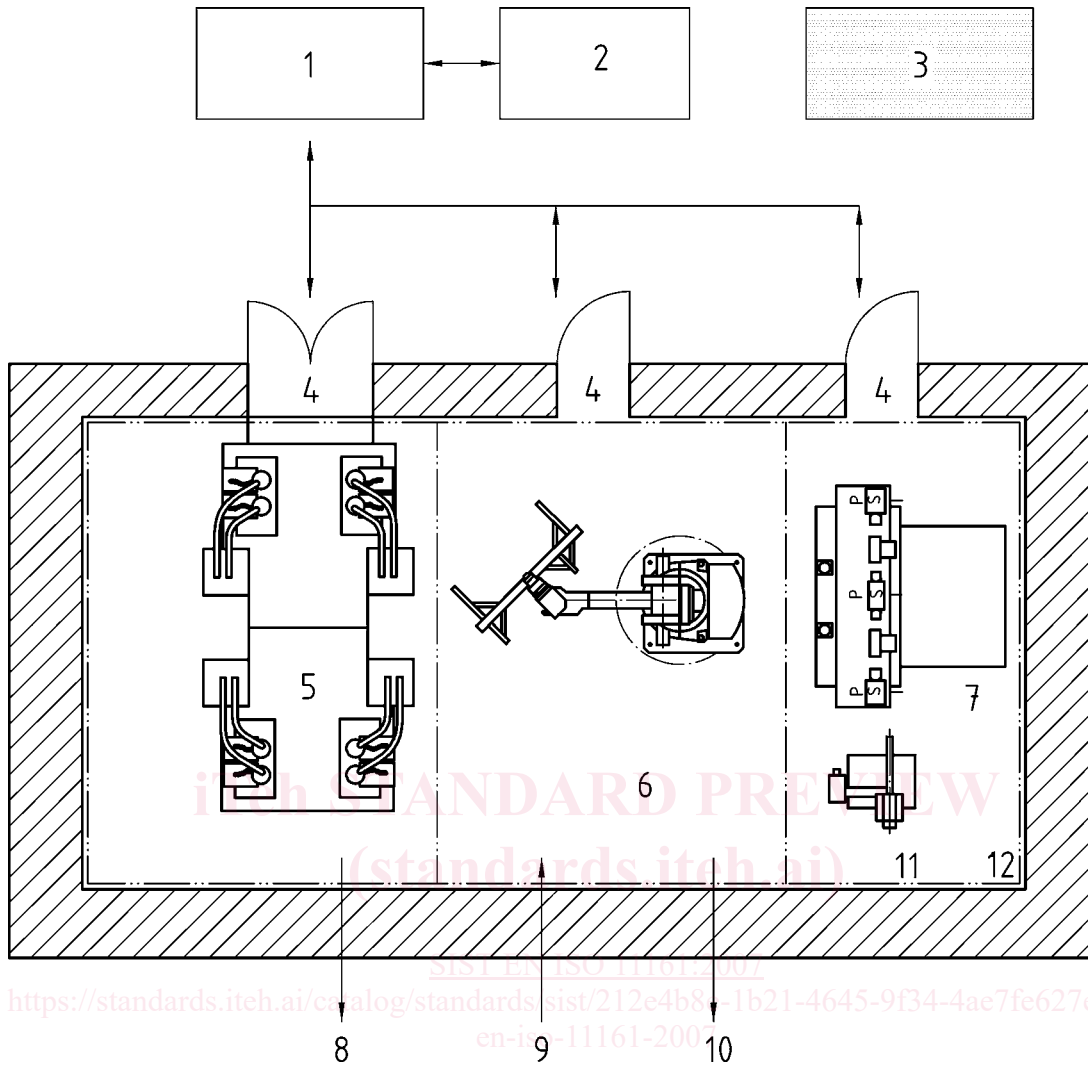


Figure 1 — Configuration of a typical manufacturing system (IMS)

Legend

- | | |
|------------------------|-------------------------|
| 1 Supervisory control | 7 Hazard zone 3 |
| 2 Operator pendant | 8 Scrap and expendables |
| 3 Physical environment | 9 Raw material |
| 4 Local control | 10 Finished good |
| 5 Hazard zone 2 | 11 Warning devices |
| 6 Hazard zone 1 | 12 Control devices |

Safety of machinery — Integrated manufacturing systems — Basic requirements

1 Scope

This International Standard specifies the safety requirements for integrated manufacturing systems (IMS) that incorporate two or more interconnected machines for the manufacturing of discrete parts or assemblies. It describes the requirements and recommendations for the safe design, installation and commissioning, safeguarding, and information for use of such IMSs (see Figure 1 for the basic configuration of an IMS).

NOTE 1 In the context of this International Standard, the term *system* refers to an integrated manufacturing system.

NOTE 2 In the context of this International Standard, the term *machine* refers to the individual component machines and associated equipment of the integrated manufacturing system.

This International Standard is not intended to cover safety aspects of individual machines and equipment that may be covered by standards specific to those machines and equipment. Where machines and equipment of an integrated manufacturing system are operated separately or individually and while the protective effects of the safeguards provided for production mode are muted or suspended, the relevant safety standards for these machines and equipment shall apply.

2 Normative References

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The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12100-1:2003, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology*

ISO 12100-2:2003, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles and specifications*

ISO 13849-1:1999, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design*

ISO 13849-2:2003, *Safety of machinery – Safety-related parts of control systems – Part 2: Validation*

ISO/IEC 13850:1996, *Safety of machinery – Emergency stop equipment*

ISO 14121:1999, *Safety of machinery – Principles of risk assessment*

EN ISO 14122-1:2001, *Safety of machinery – Permanent means of access to machinery – Part 1: Choice of a fixed means of access between two levels*

EN ISO 14122-2:2001, *Safety of machinery – Permanent means of access to machinery – Part 2: Working platforms and walkways*

EN ISO 14122-3:2001, *Safety of machinery – Permanent means of access to machinery – Part 3: Stairways, stepladders and guard-rails*

EN ISO 14122-4:2004, *Safety of machinery – Permanent means of access to machinery – Part 4: Fixed ladders*

IEC 60204-1:2000, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements*

IEC 62061:2005, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems*

3 Terms and definitions

For the purpose of this International Standard, the following definitions apply:

3.1
integrated manufacturing system
IMS
group of machines working together in a coordinated manner, linked by a material handling system, interconnected by controls (i.e. IMS controls), for the purpose of manufacturing, treatment, movement, or packaging of a variety of discrete parts or assemblies

(See also Annex E)

3.2
awareness barrier
attachment or obstacle that by physical contact warns of an approaching or present hazard

3.3
barrier
physical boundary to a hazard

3.4
bypassing
suspension of a safeguarding device

3.5
detection zone
zone within which a specified test piece will be detected by the electro-sensitive protective equipment (ESPE)

3.6
emergency stop
function which is intended:
— to avert arising or to reduce existing hazards to persons, damage to machinery or to work in progress;
— to be initiated by a single human action

NOTE ISO/IEC 13850:1996 gives detailed provisions.

[ISO 12100-1:2003, 3.37]

3.7
enabling device
additional manually operated device used in conjunction with a start control and which, when continuously actuated, allows a machine to function

NOTE IEC 60204–1:2003, 9.2.5.8 gives provisions on enabling devices.

[ISO 12100-1:2003, 3.26.2]

3.8

guard

physical barrier, designed as part of the machine, to provide protection

NOTE 1 A guard may act:

- alone; it is then only effective when it is "closed" for a movable guard or "securely held in place" for a fixed guard;
- in conjunction with an interlocking device with or without guard locking; in this case, protection is ensured whatever the position of the guard.

NOTE 2 Depending on its construction, a guard may be called e.g. casing, shield, cover, screen, door, enclosing guard.

NOTE 3 See ISO 12100-2:2003, 5.3.2, and ISO 14120 for types of guards and their requirements.

[ISO 12100-1: 2003, 3.25]

3.9

harm

physical injury or damage to health

[ISO 12100-1: 2003, 3.5]

3.10

hazard

potential source of harm

NOTE 1 The term hazard can be qualified in order to define its origin (e.g. mechanical hazard, electrical hazard) or the nature of the potential harm (e.g. electric shock hazard, cutting hazard, toxic hazard, fire hazard).

NOTE 2 The hazard envisaged in this definition:

- either is permanently present during the intended use of the machine (e.g. motion of hazardous moving elements, electric arc during a welding phase, bad posture; noise emissions; high temperature);
- or may appear unexpectedly (e.g. explosion, crushing hazard as a consequence of an unintended/unexpected start-up, ejection as a consequence of a breakage, fall as a consequence of acceleration/deceleration).

[ISO 12100-1: 2003, 3.6]

3.11

hazard zone

danger zone

any space within and/or around machinery in which a person can be exposed to a hazard

[ISO 12100-1:2003, 3.10]

3.12

hazardous situation

circumstance in which a person is exposed to at least one hazard. The exposure can immediately or over a period of time result in harm

[ISO 12100-1:2003, 3.9]